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DEFENSE ACQUISITIONS

Progress in Meeting F-22 Cost and Schedule Goals

Statement for the Record by Louis J. Rodrigues, Director, Defense Acquisitions Issues, National Security and International Affairs Division

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GAO/T-NSIAD-00-58

Mr. Chairman and Members of the Subcommittee:

Thank you for the opportunity to submit this statement for the record. The Subcommittee requested that we provide information on the status of cost and schedule issues of the Air Force's F-22 aircraft development and procurement program.

As directed by the National Defense Authorization Act for Fiscal Year 1998, we reported to the Congress in March 1999 about the extent to which cost, schedule, and performance goals were being met in the F-22 engineering and manufacturing development (EMD) program.[1] That report was supplemented by testimony before the Subcommittee on Airland Forces of the Senate Armed Services Committee in March 1999. [2] This statement summarizes the relevant parts of that report and testimony, describes the congressional actions on the fiscal year 2000 budget request, updates the information we provided to the Congress in March 1999, and discusses Air Force and contractor initiatives to control production costs. Appendix I lists products we have issued that relate to the F-22 program.

The National Defense Authorization Act for Fiscal Year 1998 established cost limits for F-22 EMD and production. The act instructed the Secretary of the Air Force to adjust the cost limits for economic inflation and compliance with changes in federal, state, and local laws. In December 1999, the cost limits, as adjusted, were $18.880 billion for EMD and $39.759 billion for production. The production cost limit does not specify a quantity of aircraft.

Results in Brief

In March 1999 we reported that it was unlikely the Air Force would be able to keep the F-22 EMD program, as planned, within the cost limit established by the Congress. In addition, we expressed concern about the significant reduction the Air Force had made in the testing it planned to complete before awarding contracts to initiate advance procurement to accelerate F-22 production.

[1] *F-22 Aircraft: Issues in Achieving Engineering and Manufacturing Development Goals* (GAO/NSIAD-99-55, Mar. 15, 1999).

[2] *Defense Acquisitions: Progress of the F-22 and F/A-18E/F Engineering and Manufacturing Development Programs* (GAO/T-NSIAD-99-113, Mar.17, 1999).

Both authorization and appropriations acts for fiscal year 2000 established further congressional direction for the F-22 program. For example, the authorization act required certification by the Secretary of Defense, prior to beginning low-rate initial production, that the EMD test plan is adequate for determining F-22 operational effectiveness and suitability. The appropriations act did not approve the beginning of F-22 low-rate initial production but approved funding for acquisition of additional flight-test aircraft with research, development, test, and evaluation funding.

The F-22 program has made progress in manufacturing and testing aircraft. However, there continues to be several important issues regarding the cost of the EMD and production programs and the schedules for completion of EMD activities leading to production of F-22s in higher quantities. For example, preliminary indications from our ongoing review of the EMD program's status show that, compared to the program's status in March 1999, sufficient cost reductions have not been implemented to ensure that EMD activities, as planned, can be completed within the cost limitation, and completion dates for testing F-22 aircraft may be further delayed. Our evaluation of the Air Force's progress in meeting cost, schedule, and performance goals is continuing as directed in the National Defense Authorization Act for Fiscal Year 1998. We plan to issue a report to the Congress concerning our current evaluation by March 15, 2000.

In 1997, the Air Force indicated that the most probable cost for production of 438 F-22 aircraft would exceed its cost estimate by $13 billion. The Air Force plans to implement initiatives to offset this projected cost increase. As requested by this Subcommittee, we have initiated a review of the Air Force's and prime contractor's efforts to reduce production costs.

EMD Program Status as of March 1999

In March 1999, the Air Force estimated it could complete the F-22 EMD program within the congressional cost limit of $18.880 billion. However, during 1998, contractor costs had exceeded budgets; in addition, work had not always been completed as scheduled. The Air Force and F-22 contractor had identified potential cost growth totaling $667 million. We reported that F-22 EMD costs would rise above the cost limit if this potential cost growth was not addressed. At that time, the Air Force and contractor were developing ways to reduce the costs, such as improving efficiency and deferring or reducing program activities to keep EMD costs within the congressional limit.

Our March 1999 report and testimony also identified several other issues that could affect the Air Force's ability to complete the program within the cost limit:

- The contractor had notified the Air Force that F-22 program costs could increase further if sales of C-130J aircraft, which are manufactured in the same plant as the F-22, were lower than anticipated because the F-22 program would have to absorb a higher than planned share of the plant's overhead costs.
- First flights of the third through the sixth test aircraft were expected to be late, reducing the time available to accomplish flight-tests before planned completion of EMD and potentially requiring extension of EMD.
- Development of the F-22's integrated avionics systems had been delayed and the schedule for completing avionics development appeared unrealistic. If EMD completion were to be extended to complete avionics development, additional costs would be incurred.
- Completing static and fatigue tests on the airframe structure had been delayed. Problems identified during these tests could require additions to planned EMD activities.

In addition, we reported that the Air Force had substantially reduced the flight-testing hours it had planned to accomplish before awarding production contracts. This would increase the risk of entering production.

Authorization and Appropriations Actions Associated With Fiscal Year 2000 Budget Request

For fiscal year 2000, the Air Force requested $1.6 billion for low-rate initial production of six F-22 aircraft. Both authorization and appropriations acts for fiscal year 2000 established further congressional direction for the F-22 program. The authorization act required that, before beginning low-rate initial production, the Secretary of Defense must certify that the EMD test plan is adequate for determining F-22 operational effectiveness and suitability; and that both EMD and production can be executed within the respective cost limits. The appropriations act, among other provisions affecting the F-22 program, did not approve the beginning of F-22 low-rate initial production but approved funding for acquisition of additional flight-test aircraft with research, development, test, and evaluation funding. The appropriations act restricted award of a fully funded contract to begin low-rate initial production until (1) the first flight of an F-22 incorporating block 3 avionics software has been conducted; (2) the Secretary of Defense certifies to the congressional defense committees that criteria identified in the act for the award of low-rate initial production have been met; and (3) the Director of Defense Operational Test and Evaluation reports on the

adequacy of testing to date to measure and predict performance of F-22 avionics systems, stealth characteristics, and weapons delivery systems.

Current EMD Program Status

Before I discuss the current EMD program, I need to point out that the congressional actions on the fiscal year 2000 budget for the F-22 program could require changes to the F-22 program that have not, at this time, been fully defined. Accordingly, our comments regarding the program may change as the Air Force and Department of Defense change the program and the relationships between EMD activities and initiation of the production phase of the F-22 program. The F-22 program has made progress in manufacturing and testing aircraft; however, there continues to be several important issues regarding the cost of the EMD and production programs, and the schedules for completion of EMD activities that are intended to lead to production of F-22s in higher quantities. Preliminary indications from our ongoing review of the EMD program's status are that, compared to the program's status in March 1999, (1) sufficient cost reductions have not yet been implemented to ensure that EMD activities, as planned, can be completed within the cost limitation; (2) the impact on the F-22 program of lower than planned C-130J sales has not been determined; (3) deliveries of F-22 test aircraft have been further delayed; (4) fiscal year 2000 actions by the Congress increased the time available to test F-22s before beginning low-rate initial production; (5) some avionics milestones have been further delayed; (6) the avionics schedule planned by the Air Force still appears to be unrealistic; and (7) completion dates for testing of ground test articles have been further delayed. I will now discuss each of these areas in greater detail.

Mitigation of Identified Cost Growth in EMD Program

According to the Air Force, $536.7 million (about 80 percent) of the identified $667 million in F-22 EMD cost growth has been mitigated through implementation of various cost reduction initiatives. These initiatives are designed to reduce costs by improving efficiency and deferring or reducing program activities. However, the cost growth to be mitigated could be larger than previously determined. The Air Force provided us information showing that the potential cost growth may increase. We are reviewing the Air Force's identification of and plans to mitigate this additional cost growth.

Potential Impact if C-130J Sales Are Lower Than Planned

Because of the lower than anticipated sales of the C-130J cargo aircraft by Lockheed Martin, the F-22 program may have to absorb a higher share of the Lockheed Martin plant's overhead costs. Lockheed Martin produces both the C-130J cargo aircraft and the F-22 aircraft in its Marietta, Georgia, plant. The agreement in effect in March 1999 between Lockheed Martin and the Air Force concerning the distribution of plant overhead costs for both the C-130J and the F-22 program was predicated on the production of 24 to 25 C-130J aircraft per year. However, 19 C-130J aircraft were produced in calendar year 1999, and production for calendar years 2000-2003 is estimated at about 17 aircraft per year. Reductions in C-130J aircraft produced could result in higher amounts of overhead costs being absorbed by the F-22 program.

Delays in Delivering Test Aircraft

The 1997 flight-test plan included about 250 flight-test months.[3] In March 1997, we testified that because of manufacturing problems, several flight-test aircraft would be delivered late, resulting in 16.9 fewer flight-test months available through scheduled completion of EMD. In June 1999, the Air Force acknowledged further delays in the delivery of most of the flight-test aircraft due to continuing wing delivery problems. As a result of the further delay, there are now almost 29 fewer flight-test months available. If the test program were to be extended, the cost of EMD would increase.

We are concerned that additional delivery delays may further reduce flight-test months available to complete flight-testing. For example, Lockheed Martin recently reported that wing deliveries may be further delayed. Flight-test time is essential for the program to test and prove specific features of the aircraft as well as to reduce the risk to the government as commitments are made to production.

Congressional Actions Allow for More Testing Time Prior to Low-rate Initial Production

Because of delays in the EMD program, the Air Force substantially reduced the amount of flight-testing planned before beginning production. At the beginning of 1999, the program goal was to complete a total of 519 flight-test hours by the end of 1999. Even though the Air Force is close to reaching this goal, as we reported in March 1999, earlier plans scheduled many more flight-test hours for completion by December 1999, which at the

[3] A flight-test month is one flight-test aircraft available for 1 month.

time, was the planned date of the first low-rate initial production contract award. The actions of the Authorization and Appropriations Committees on the fiscal year 2000 budget delayed the beginning of production until certain conditions are met. As a result, more time is available to complete flight-tests, therefore reducing risks before the decision is made to commit to low-rate initial production. As the Air Force makes changes to the F-22 program to reflect fiscal year 2000 congressional actions, we will continue evaluating the relationships of EMD, testing, and production commitments.

Avionics Milestones Are Further Delayed

We reported in March 1999 that development of avionics systems for the F-22 was behind the schedule established in 1997. Development problems with the communication, navigation and identification system, and, to a lesser extent, the electronic warfare system caused schedule delays and cost growth in avionics development. Because of these problems, the Air Force did not complete the first major avionics segment, known as block 1, until May 1999, 4 months behind schedule. Furthermore, we reported in March 1999 that the first flight of the first avionics test aircraft with block 1 avionics was scheduled for February 2000, but this event is now scheduled for May 2000. Flight-testing of the next scheduled avionics segment, known as block 2, is also expected to be delayed.

Avionics Schedule Still Appears Unrealistic

In 1997, an evaluation team concluded that avionics development could take more time than planned because of delays in avionics blocks 1, 2, 3, and 3.1. Even though block 1 was completed[4] behind schedule and block 2 is expected to be completed behind schedule, the current avionics schedule shows blocks 3 and 3.1 avionics being completed 6 and 3 months, respectively, before the completion dates the Air Force and the evaluation team considered realistic in 1997. If blocks 3 and 3.1 take longer than planned to be completed, additional costs will be incurred.

Further Delays in Testing of Ground Test Articles

Two major tests of F-22 airframe structural integrity continue to be delayed. These are static testing, designed to ensure the aircraft can withstand flight stresses, and fatigue testing, which involves subjecting the aircraft to the structural stresses expected within its planned life. Static tests have been delayed 12 months and fatigue tests have been delayed

[4] That is, completed to the point it is placed on an EMD aircraft in preparation for flight-testing.

14 months. These are longer delays than the Air Force expected in March 1999. The following table shows the continuing delays in completing these tests by comparing the schedules in 1997, March 1999, and as of November 1999.

Table 1: Delayed Completion Dates for Static and Fatigue Testing

Test	1997 schedule	March 1999 schedule	Schedule as of November 1999
Static	October 1999	February 2000	October 2000
Fatigue	December 1999	September 2000	February 2001

F-22 Production Cost Reduction Initiatives

Concerned about growing costs of the F-22 program, the Assistant Secretary of the Air Force for Acquisition, in June 1996, established a team to estimate the most probable costs of the F-22 EMD and production programs. The team estimated, in January 1997, that the production costs for 438 F-22s would increase by $13.1 billion to about $61.2 billion. The team identified cost reduction initiatives that it expected to offset the production cost increase. DOD subsequently reduced the planned procurement quantity to 339 aircraft.

On November 23, 1999, this Subcommittee asked us to review the progress the Air Force and the contractors have made in implementing cost reduction initiatives needed to remain within the production cost limit for the program. We have initiated the requested review.

This concludes our statement. We appreciate the opportunity to have it placed in the record.

Contact and Acknowledgments

For future contacts regarding this statement, please contact Louis J. Rodrigues at (202) 512-4841. Individuals making key contributions to this statement included Marvin Bonner, Todd Brannon, Edward Browning, Leonard Benson, Allen Li, Robert Murphy, and Don Springman.

Related GAO Products

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